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| APPLICATION NO.             | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------|-------------|----------------------|---------------------|------------------|
| 10/028,300                  | 12/28/2001  | Hong Suk Yoo         | 8733.508.00-US      | 2980             |
| 30827                       | 7590        | 04/06/2004           | EXAMINER            |                  |
| MCKENNA LONG & ALDRIDGE LLP |             |                      | DUONG, THOI V       |                  |
| 1900 K STREET, NW           |             |                      | ART UNIT            |                  |
| WASHINGTON, DC 20006        |             |                      | PAPER NUMBER        |                  |

2871

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/028,300             | YOO ET AL.          |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Thoi V Duong           | 2871                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 and 9-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,6 and 17-31 is/are allowed.
- 6) ☒ Claim(s) 1-4,7 and 10-16 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. This office action is in response to the Amendment, filed December 30, 2003.

Accordingly, claims 1, 7, 9, 10, 15 and 16 were amended, and claim 8 was canceled. Currently, claims 1-7 and 9-31 are pending in this application.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-4, 7 and 9-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 7 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 7 and 9 are indefinite since they are not consistent with Fig. 6.

Re claim 1, Fig. 6 shows that the storage electrode 16 is formed on (not buried in) the gate insulating film 39.

Re claims 7 and 9, Fig. 6 shows that the storage electrode 16, the active layer 15, and the ohmic contact layer 20 are formed on the gate insulating film 39. Fig. 6 does not show a second gate insulating film formed on the first gate insulating film to cover the storage electrode.

Claims 2-4 and 10-16 are also rejected since they are dependent on the indefinite claims.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeong (USPN 6,137,551).

Re claim 1, as shown in Figs. 5 and 6, Jeong discloses a liquid crystal display device including a data line 55L supplied with a data signal, a gate line 53L supplied with a scanning signal, a pixel electrode 62 for driving a liquid crystal cell, and a thin film transistor 51 for applying the data signal to the pixel electrode in response to the scanning signal, the device comprising:

a gate insulating film 52 entirely covering the gate line; and

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a storage electrode 61 buried in the gate insulating film 52 to overlap with the gate line 53L.

Re claim 2, Jeong discloses that the gate insulating layer 52 is formed with a thickness of preferably 800 to 1000 Å (col. 5, lines 66-67); since the gate insulating layer 52 is formed right between the gate line 53L and the storage electrode 61 as shown in Fig. 7B, a distance between the gate line 53L and the storage electrode 61 is about 800 to 1000 Å.

Re claim 3, the liquid crystal display device of Jeong further comprises a protective layer 56 on the gate insulating film 52 to cover the data line 55L, the gate line 53L and the thin film transistor 51.

7. Claims 7 and 10-16 rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura (USPN 5,672,888).

Re claim 7, as shown in Figs. 4(a)-4(c), Nakamura discloses a liquid crystal display (LCD) device comprising:

a gate line 216' and a data line 215' on a substrate 201 to cross each other;

a thin film transistor including a gate electrode 202, a source electrode 205, and a drain electrode 205b, and provided at an intersection between the data line and the gate line (col. 7, lines 5-7);

a storage electrode 221 on a first gate insulating film 204; and

second gate insulating film 210 formed on the first gate insulating film 204 to cover the storage electrode 221.

From Fig. 4(a), the gate line 216' is connected to the gate electrode 202; therefore, the gate insulating film 204 covers the gate electrode and the gate line. It is inherent that the gate insulating film electrically isolates the gate line and the data line from each other in order for the display to work.

Re claim 11, the gate electrode 202 is connected to the gate line 216'.

Re claim 12, the source electrode 205 is connected to the data line 215 (Fig. 4(b)); and

Re claim 13, the drain electrode 205b is opposed to the source electrode, and wherein a channel 207 is formed between the source electrode and the drain electrode.

Re claim 10, the liquid crystal display device further comprises a protective layer 212 formed on the second gate insulating film 208 to cover the gate line 216, the data line 215, and the thin film transistor,

wherein, re claim 14, a pixel electrode 223 is connected to the drain electrode 205b via a first contact hole 218 provided on the protective layer 212 (Fig. 4(b));

wherein, re claim 15, the storage capacitor includes a storage electrode 221 and the gate line 216' opposed to each other and having the first gate insulating film 204 formed therebetween as shown in Fig. 4 (a)-4(c); and

wherein, re claim 16, the storage electrode 221 is connected to a transparent electrode pattern 223 via a second contact hole 219 passing through the second gate insulating film 208 and the protective layer 212 as shown in Fig. 4(c).

8. Claims 7 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Applicant's Prior Art Figs. 1 and 2.

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Re claim 7, as shown in Figs. 1 and 2, Applicant's Prior Art discloses a liquid crystal display (LCD) device comprising:

a gate line 2 and a data line 4 on a substrate 1 to cross each other;

a thin film transistor including a gate electrode 54, a source electrode 51, and a drain electrode 52, and provided at an intersection between the data line and the gate line;

a storage electrode 6 on a first gate insulating film 9 to cover the gate electrode 54 and the gate line 2 and to electrically isolate the gate line 2 and the data line 4 from each other; and

a second gate insulating film 53 formed on the first gate insulating film 9 to cover the storage electrode 6.

Note that the insulating film 53 is considered as a second gate insulating film since its function is to cover the gate electrode 54, the gate line 2 and the storage electrode 6 as shown in Fig. 2.

Re claim 11, the gate electrode 54 is connected to the gate line 2.

Re claim 12, the source electrode 51 is connected to the data line 4.

Re claim 13, the drain electrode 52 is opposed to the source electrode 51, and a channel is formed between the source electrode and the drain electrode.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong (USPN 6,137,551) as applied to claims 1-3 in view of Lee (USPN 5,920,362).

Jeong discloses a liquid crystal display device that is basically the same as that recited in claim 4 except that the pixel electrode is connected to the storage electrode via a contact hole passing through the gate insulating film and the protective layer. As shown in Fig. 1E, Lee discloses a pixel electrode 24 connected to a storage electrode 6a via a contact hole passing through a gate insulating film 8 and a protective layer 22. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Jeong with the teaching of Lee by forming the pixel electrode and the storage electrode connected together via a contact hole so as to realize a high quality image display (col. 1, lines 15-26).

***Allowable Subject Matter***

11. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. See below reasons for allowance.

12. Claims 5, 6 and 17-31 were previously allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly suggests or shows all of the limitations as claimed. Specifically,

Re claims 5 and 17, none of the prior art of record discloses, in combination with other limitations as claimed, a storage electrode formed on a first gate insulating film to overlap with the gate line, a second gate insulating film deposited on the first gate



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insulating film to cover the storage electrode, and an active layer and an ohmic contact layer formed on the gate insulating films.

The most relevant references, USPN 6,356,318 B1 of Kawahata and USPN 5,998,838 of Tanabe et al., fails to disclose or suggest a second gate insulating layer formed on top of the storage electrode. The Kawahata's reference only discloses the storage electrode formed on top of and inside the concave portion on the second gate insulating layer as shown in Fig. 1. Meanwhile, as shown in Fig. 11 (c), the Tanabe et al.'s reference only discloses an active layer 1015 and an ohmic contact layer 1017 formed on a second gate insulating film 1014b to overlap with a gate electrode 1013a.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong



03/24/2004



TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER